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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/734,154	12/11/2000	Adwait Ratnaparkhi	Y0R9-2000-0468US1 (8728-4	4210

7590 08/06/2004

EXAMINER
SHORTLEDGE, THOMAS E

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 08/06/2004

Frank Chau, Esq.
F. Chau & Associates, LLP
Suite 501
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East Meadow, NY 11554

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/734,154	RATNAPARKHI, ADWAIT	
	Examiner	Art Unit	
	Thomas E Shortledge	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☑ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 8 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the parameters w_i, w_{i-1}, w_{1-2}, and the value of P, when i = 1 or 2. These elements are important to the invention as they define the relation of the claimed formula to the invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-7, 9-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van De Veen (5,943,643) in view of Dale 2nd Reiter et al. "Building Applied Natural Language Generation Systems" (EACL-99) and in further view of Chen et al. (5,806,021).

As to claim 1, Van De Veen does teach:

computer-based method of generating natural language (apparatus comprises a computer system, col. 2, lines 27-29);

receiving a concept comprising attributes and corresponding values of each of said attributes from a user (input that is dependent of the relationships and links between each and also the ambiguities between each, col. 2, lines 55-58);

receiving grammar rules from the user (input language lexicon that defines the grammatical categories of the input which define the words and word order, col. 3, lines 1-5 and 23-27);

wherein each phrase fragment includes one of said attributes, (a phrase can be made up of a noun, adjective and verb, col.7, lines 3-10).

Van De Veen, does not teach:

each rule including a head, phrase fragment, a direction and a condition,

wherein each phrase fragment includes on of said attributes;

receiving a scoring function from the user;

determining an optimal natural language phrase from the possible natural language phrases using the scoring function;

generating possible natural language phrases using the grammar rules;

returning said optimal natural language phrase to the user

However, Dale and Reiter teach:

each rule including a head, a phrase fragment, a direction and a condition (rules of word formation and rules of sentence formation, rules such as forming verb tense, forming noun plurals. Rules of direction such as, subject goes before the verb, the subject and verb should agree, page 56. slide 166, and page 20 slides 58-60);

receiving scoring function from the user (deriving schemas from a corpus, page 33, slide 98)

generating possible natural language phrases using the grammar rules, (realization tasks that include insert function words, choosing correct inflection of content words, ordering words within a sentence and applying orthographic rules, page 56. slide 166);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the input grammar, phrase, and schema definitions of Reiter et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Reiter et al. page 1, slide 2.

Van De Veen and Reiter et al. do not teach:

returning said optimal natural language phrase to the user;

determining an optimal natural language phrase from the possible natural language phrases using the scoring function

However, Chen et al. do teach:

returning said optimal natural language phrase to the user (the segmented phrase with the highest likelihood is output, col. 4, lines 25-27);

determining an optimal natural language phrase from the possible natural language phrases using the scoring function (the stacked is pruned based on the likelihood match score, and then the stack is stored based on this score, col. 5, lines 45-50);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the input grammar, phrase, and schema definitions of Reiter et al. and with the output of Chen et al. to increase the semantic accuracy of the translation method, as taught by Chen et al. col. 2, lines 1-4.

5. As to claim 2, Van De Veen does teach that the head is a word (a noun which is connected to both a adjective and to a transitive verb is a phrase clause, it would have been inherent that since the noun, adjective, verb clause is in English, there would be a leading word in the phrase (head), col. 7, lines 3-5).

6. As to claim 3, Van De Veen does teach of a phrase fragment that is a natural language phrase fragment (phrase is made up of noun which is qualified by an adjective and a verb, col. 7, lines 3-5).

7. As to claim 4, Van De Veen teaches a direction that indicates the location of the phrase fragment (if the current word is qualifies the proceeding word, that current is word is placed on the left-hand side, if the current word is qualified by the proceeding word, the current word is placed on the right hand side, col. 7, lines 22-28).

8. As to claim 5, Van De Veen teaches the condition as a code fragment for restricting use of a rule (search codes to be stored in search space when processing the current word and the argument of the current, the sixth column indicates the previously stored search codes to be removed from the search, col. 9, lines 43-49).

9. As to claim 6, Van De Veen teaches each attribute in the optimal natural language phrase is replaced with its corresponding value (the analyzer module searches for the words in the left hand column of Table 1 for the same word and, when this s found, obtains the corresponding meaning shown in the third column of Table 1, assigns unique values to the arguments and inserts that meaning with the values, col. 5, lines 64-67, and col. 6, lines 1-3).

10. As to claim 7, Van De Veen does not teach the optimal natural language phrase is a highest scoring natural language phrase that is consistent with the grammar rules.

However, Reiter et al does teach constructing the content by determining the most useful clustering of information, and representing these clusterings in a way that makes the best expression (slide 106, page 36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the natural language phrase creator of Reiter et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Reiter et al. page 1, slide 2.

11. As to claim 9, Van De Veen does not teach the attributes are variables.

However, Reiter et al. do teach that the attributes are variables (grammar supplies a set of choices for realization which are made on the basis of the input sentence plan, page 58, slide 172)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the input scoring capabilities taught by Okajima, with grammar and phrase definitions of Reiter et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Reiter et al. page 1, slide 2.

12. As to claim 10, Van De Veen teaches the direction indicates that the location of the phrase fragment is right of the head (if the current word is qualified by the preceding word, the selected value of the meaning of the current word is

placed upon the right-hand side of the equation, as for the example "camera on," col. 7 lines 26-31, and col. 8 lines 1-3).

13. As to claim 11, Van De Veen teaches the direction indicates that the location of the phrase fragment is left of the head, (if the current word qualifies the preceding word, the selected value of the meaning of the current word is placed on the left-hand side of the equation, as per the example, "the camera," col. 7, lines-22-27, and col. 8, lines 1-3).

14. As to claim 12, Van De Veen does teach:

Program storage device readable by a machine (computer is comprised of a memory which stores programs, col.2, lines 34-35);

receiving a concept comprising attributes and corresponding values of each of said attributes from a user (input that is dependent of the relationships and links between each and also the ambiguities between each, col. 2, lines 55-58);

receiving grammar rules from the user (input language lexicon that defines the grammatical categories of the input which define the words and word order, col. 3, lines 1-5 and 23-27);

wherein each phrase fragment includes one of said attributes, (a phrase can be made up of a noun, adjective and verb, col.7, lines 3-10).

Van De Veen, does not teach:

each rule including a head, phrase fragment, a direction and a condition,

wherein each phrase fragment includes on of said attributes;

receiving a scoring function from the user;

determining an optimal natural language phrase from the possible natural language phrases using the scoring function;

generating possible natural language phrases using the grammar rules;

returning said optimal natural language phrase to the user

However, Reiter et al. teach:

each rule including a head, a phrase fragment, a direction and a condition (rules of word formation and rules of sentence formation, rules such as forming verb tense, forming noun plurals. Rules of direction such as, subject goes before the verb, the subject and verb should agree, page 20, slides 58-60);

receiving scoring function from the user (deriving schemas from a corpus, page 33, slide 98)

generating possible natural language phrases using the grammar rules, (realization tasks that include insert function words, choosing correct inflection of content words, ordering words within a sentence and applying orthographic rules, page 56, slide 166);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the input grammar, phrase, and schema definitions of Reiter et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Reiter et al. page 1, slide 2.

Van De Veen and Reiter et al. do not teach:

returning said optimal natural language phrase to the user;

determining an optimal natural language phrase from the possible natural language phrases using the scoring function

However, Chen et al. do teach:

returning said optimal natural language phrase to the user (the segmented phrase with the highest likelihood is output, col. 4, lines 25-27);

determining an optimal natural language phrase from the possible natural language phrases using the scoring function (the stacked is pruned based on the likelihood match score, and then the stack is stored based on this score, col. 5, lines 45-50);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the input grammar, phrase, and schema definitions of Reiter et al. and with the output of Chen et al. to increase the semantic accuracy of the translation method, as taught by Chen et al. col. 2, lines 1-4.

15. As to claim 13, Van De Veen does teach that the head is a word (a noun which is connected to both a adjective and to a transitive verb is a phrase clause, it would have been inherent that since the noun, adjective, verb clause is in English, there would be a leading word in the phrase (head), col. 7, lines 3-5).

16. As to claim 14, Van De Veen does teach of a phrase fragment that is a natural language phrase fragment (phrase is made up of noun which is qualified by an adjective and a verb, col. 7, lines 3-5).

17. As to claim 15, Van De Veen teaches a direction that indicates the location of the phrase fragment (if the current word is qualifies the proceeding word, that current is word is placed on the left-hand side, if the current word is qualified by the proceeding word, the current word is placed on the right hand side, col. 7, lines 22-28).

18. As to claim 16, Van De Veen teaches the condition as a code fragment for restricting use of a rule (search codes to be stored in search space when processing the current word and the argument of the current, the sixth column indicates the previously stored search codes to be removed from the search, col. 9, lines 43-49).

19. As to claim 17, Van De Veen teaches each attribute in the optimal natural language phrase is replaced with its corresponding value (the analyzer module searches for the words in the left hand column of Table 1 for the same word and, when this s found, obtains the corresponding meaning shown in the third column of Table 1, assigns unique values to the arguments and inserts that meaning with the values, col. 5, lines 64-67, and col. 6, lines 1-3).

20. As to claim 18, Van De Veen does not teach the optimal natural language phrase is a highest scoring natural language phrase that is consistent with the grammar rules.

However, Reiter et al does teach constructing the content by determining the most useful clustering of information, and representing these clusterings in a way that makes linguistic expression easy (slide 102, page 36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the natural language phrase creator of Reiter et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Reiter et al. page 1, slide 2.

21. As to claim 20, Van De Veen does not teach the attributes are variables.

However, Reiter et al. do teach that the attributes are variables (grammar supplies a set of choices for realization which are made on the basis of the input sentence plan, page 58, slide 172)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output system of Van De Veen with the input scoring capabilities taught by Okajima, with grammar and phrase definitions of Reiter et al. to increase the efficiency of producing understandable texts in English from some underlying non-linguistic representation as taught by Reiter et al. page 1, slide 2.

22. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van De Veen in view of Reiter et al. and Chen et al. as applied to claims 1 and 12 above, and further in view of Asahara et al., (17th conference on computational linguistics).

Van De Veen, and Reiter et al. do not teach that the scoring function comprises the equation:

$$\Pi_{i=1...N} P(w_i|w_{i-1},w_{i-2})$$

However, Asahara et al. teach using trigrams and include the scoring function:

$$P(T) = \prod_{i=1}^{n} P(t_i|t_{i-2,i-1})$$

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the input and output systems of Van De Veen, Reiter et al. and Chen et al. with the scoring function of Asahara et al. to improve the part-of-speech tagging natural language models, as taught by Asahara et al. (page 21, col. 1).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Berger et al. (Computational Linguistics), Su et al. (5,418,717), Bangalore et al. (2002/0026306), Weiwei (Proceedings of ICSP' 96),

Patton et al. (Oct. 1991), Tokuume et al. (5,101,349), and Reiter et al. (1995 Cambridge).

Berger et al. teach the maximum-likelihood approach for automatically constructing maximum entropy models.

Su et al. teach providing a score function for disambiguating or truncating for finding scores.

Bangalore et al. teach a probabilistic model for natural language generation.

Weiwei et al. teach a natural language generation system which can automatically produce Chinese text.

Patton et al. teach a method for real-time generation of natural language.

Tokuume et al. teach a natural language processing system.

Reiter et al. (1995) teach the construction of a natural language generation system, when these techniques should be used, and suggestions for carrying them out.

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas E Shortledge whose telephone number is (703)605-1199. The examiner can normally be reached on M-F 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on 703-306-3011. The

fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER

TS
7/19/04